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AUTHOR Levenston, E.A.; And Others
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ABSTRACT

The discourse cloze, an alternative cloze procedure, is described. It is argued that in the regular cloze procedure many of the words can be supplied from the "micro" context, and thus the regular cloze is not necessarily a test of reading comprehension on the "macro" level. In the discourse cloze approach, all words deleted from a passage of continuous discourse are markers of cohesion, of relationships between propositions. The discourse cloze may prove to be a better test of readers' overall grasp of a text because successful performance depends on the ability to reconstruct the underlying macro propositions. Examples are given of the range of markers that can be deleted in a discourse cloze, including anaphoric reference, substitution, ellipsis, conjunction, and lexical devices. The psychological processes involved in restoring them to the text are discussed. The discourse cloze technique is also promising as a method for teaching reading comprehension and as an approach to research on reading comprehension. (Author/RW)

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DISCOURSE ANALYSIS AND THE TESTING OF
READING COMPREHENSION BY CLOZE TECHNIQUES

E.A. Levenston

R. Nir

S. Blum-Kulka

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1. Introduction

Understanding a written text -- whether in one's mother tongue or in a second language -- is clearly a highly complex process. Just as a text can be viewed as a hierarchy of units at different levels of analysis -- from word to sentence to paragraph to discourse -- so understanding a given text can be seen as a hierarchy of skills corresponding to these levels: recognising the content-words, knowing the semantic function of grammatical structures, construing the sentences, identifying the inter-sentence relationships, supplying an overall interpretation for the text in all its intersections, appreciating the tone in which the whole discourse is written. This listing of the linguistic components of reading comprehension makes no claim to explain the psychological processes involved; we know very little about how these separate skills are integrated in the act of reading.⁽²⁾ We assume, however, that such lists of the linguistic components involved provide a useful tool for analysing techniques that have been proposed for testing reading comprehension.

An ideal test of reading comprehension would presumably test all the skills, and the weight attached to each skill would be scaled in proportion to its importance in the act of comprehension. But the precise contribution of each skill to the grasp of meaning at all levels can never be accurately measured. Like any ideal, such an ideal test is unattainable. Alternatively, if the skills are hierarchically ordered, then testing the higher-order skills -- identifying inter-sentence

relationships, grasping conveyed meanings, appreciating tone -- inevitably tests lower-order skills as well; without a grasp of at least part of the word meaning and sentence syntax, one cannot trace the thread of discourse.

The plan of the present essay is threefold. First we shall analyze regular cloze procedure, one of the most popular ways of testing reading comprehension, in order to determine which of the skills listed may be involved in completing a cloze test. The underlying rationale for using cloze procedure as a test of reading comprehension is probably the belief that in the long run, over an extended passage of discourse, it does test all skills. Though such a claim is difficult if not impossible to verify, detailed item analysis can at least reveal which skills are required to restore any single deletion. Secondly, we shall describe an alternative procedure, a modification of regular cloze, based on the assumption that testing higher-order skills, especially the grasp of inter-sentence relationships, will inevitably involve the lower-order skills as well. Finally, we shall discuss some of the psycholinguistic implications, for both testing and teaching, of the proposed new procedure.

2. Regular cloze procedure

The cloze test is generally considered an integrative measure of second-language proficiency (Oller, 1973b). Cloze tests have been claimed to be highly correlated with tests of nearly every language skill and with every other type of language test. Oller (1973b) claims that the abilities measured by the cloze are based on a "grammar of expectancy": linguistic redundancies and contextual information narrow the range of

possibilities the respondent chooses from in completing the correct missing item. Researchers do not agree, however, as to the exact specifications of the language abilities measured by cloze tests. Chichora et al. (1977), for example, claim that close tests are sensitive to discourse constraints across sentences, while Alderson (1979) suggests that cloze tests are probably capable of measuring only lower-order "core" proficiency skills. (3)

We believe that this issue can best be clarified by a detailed examination of the nature of the problem-solving task presented by each blank in the text. (4) We will attempt to show that by analysing the nature of the interdependence between the omitted language items and the given text, we can come nearer to understanding the processes involved in completing these items. If cloze tests are to be considered measures of reading comprehension, it must be assumed that in processing a defective text in order to restore deletions, a reader necessarily invokes the same procedures as he uses in understanding a complete text where, for instance, he may not know the dictionary meaning of each word. But whether these processes — reading a complete text and supplying blanks in a deleted text — do parallel each other at all levels has never, so far as we know, been systematically examined.

Recent studies in discourse analysis (Van Dijk, 1977b; Widdowson, 1978; Blum-Kulka and Nir, 1981) suggest that coherent stretches of discourse — "texts" — exemplify a series of identifiable textual and discourse features. (See Section 3 below for detailed analysis of such features). It has been shown that sentences become a text if the propositions expressed in them (the "micro"-units) are topically and logically interconnected to form meaningful discourse units ("macro"-units). Studies in text-processing

(Vipond, 1980) have shown that in the overall understanding of a text, the reader processes information both on the micro-level of single propositions (realised in words and sentences) and on the macro-level of discourse units (realised in intersententially connected stretches of text). Since words in regular cloze are omitted randomly (every nth word) their restoration to the text might involve either micro- or macro-processing or both. We do not know how the reader actually processes the text to arrive at his completions. After analysing the context of the deletions, we feel we can, however, specify the minimal information that should be needed for supplying the correct or semantically acceptable item in each case.

The inferencing process needed for reconstructing cloze tests can rely on a range of linguistic, pragmatic and textual clues.

2.1. The linguistic component

By 'linguistic' we mean cases in which the meaning and form of the missing word are clearly specified by the linguistic micro-context in which the deletion occurs. Basing our analysis on the approach of Nida and Taber (1974), we suggest that the "contextual conditioning" of words in context (or in the case of the cloze, missing words) can be either syntactic or semotactic in nature or both. By "syntactic" we mean cases in which the word intended is clearly specified by the grammatical construction in which the deletion occurs. By "semotactic" we mean cases in which the meaning and lexical choice of the intended word is confirmed (or, in the case of the cloze, provided) by the interaction of that word with the meaning and occurrence of other words within the context. Though in some

cases either semotactic or syntactic marking suffice to specify the exact word, in many cases missing items in a cloze text can only be supplied on the basis of their interaction. The process involved can be illustrated by examining blanks on a regular cloze test. For purposes of illustration, each kind of marking is exemplified by sentences containing only one blank. The full text from which these sentences are quoted is given in Appendix A.

I. Syntactic marking

Example 1. For example, he will learn its language...its ideas about what _____ funny and what is serious and so on.

2. The way in _____ an individual acquires the culture of his society is known as socialization.

In 1, the grammatical construction specifies the need for a copula; the following phrase ('and what is serious') delimits its tense. In example 2, the presence of 'in' after 'way' indicates that a post modifier is required and the presence of the verb 'acquired' limits the choice to 'which'.

II. Semotactic marking

3. ...the child grows up, surrounded by _____ and sisters.

4. ...he gradually learns things about the society in which he lives.

For example, its ideas about _____ and wrong.

In both I and II the minimal information the student has to bring to the task is familiarity with two collocations: 'brothers and sisters' and 'right and wrong'. Deletions which occur within set phrases, idioms or any two words that regularly co-occur require from the student only lexical

knowledge and no text processing at the inter-sentence level. If the items are known, the completion can be automatic.

5. In other words, the child will learn the culture of his society through his contact with, at first the _____ of his family.

In example 5 the linguistic environment marking the missing item is less clearly defined; though the word 'members' might be supplied on the basis of its association with family alone (by virtue of the fact that both words belong to the same lexical set) it can also be arrived at by processing other cues in the sentence (the child...at first). But in both cases the linguistic context involved does not exceed the sentence. In other words, as with syntactic marking in examples 1 and 2, semotactic marking is tied to micro-processing.

III. Syntactic and semotactic marking

6. Socialization is not confined to communication and relationships between parents and children, nor does it finish in childhood but _____ on throughout life.

In this example, syntactic and semotactic marking interact in pinpointing the missing item. The syntactic structure of the clause dictates the choice of a verb. The preposition 'on' further delimits the lexical choice to a prepositional verb with 'on'. But the meaning of the missing item has to be inferred from the preceding proposition (nor does it finish in childhood but...).

Examples 1 to 6 have been deliberately presented out of context; the fact that they can be completed easily without the context speaks for itself.

In cases like these, the ability tested is predominantly a linguistic one; the student is required to activate his feeling for grammar and his semantic knowledge in processing sentence level contexts. Though understanding clauses and sentences is obviously a part of all reading comprehension, it is not sufficient for reading texts larger than single sentences. In random deletion, the proportion of items dependent on micro-processing of a linguistic nature might easily exceed the proportion of items dependent on macroprocessing. In such a case, a score of over fifty per cent, based on correct completion of items at the micro level, would ostensibly indicate a satisfactory level of reading comprehension without the student's ability to process at the macro level having been adequately tested.

2.2. The pragmatic component

Differences in the number of clause- and sentence-bound words in proportion to text-bound words might be one of the variables that explain inconsistencies in cloze results, for example, the fact that different deletion frequencies might yield significantly different mean scores on some texts, but not on others (Alderson, 1980). Another factor that might explain inconsistencies in cloze results across texts is the level of previous knowledge assumed by the text, and the proportion of omitted items relating to this knowledge. Any given text assumes a certain amount of extra-textual knowledge. Comprehension in general, and reading comprehension in particular are partly based on the reader's ability to relate the information given in the text to relevant extratextual knowledge (Van Dijk, 1977a; Fillmore, 1981). Text genres may vary greatly in regard to the extra-textual knowledge they

assume; newspaper headlines, for example, normally presuppose specific extratextual familiarity with current events (Blum-Kulka & Nir, 1981). While we would expect a legislative text to presuppose a minimum of previous knowledge.

Two texts of the same lexical grammatical difficulty might differ in this regard, and consequently yield different cloze results. For example, in comparing a historical narrative cloze test with a newspaper story judged by teachers to be of the same level of linguistic difficulty, we found that the first contained fifty per cent of items that required specific historical knowledge for completion, while the second text contained only twelve per cent such items. (4)

We have termed the ability to replace items that require extra textual knowledge in the cloze a 'pragmatic' ability. At the most general level, pragmatic ability is the general knowledge of the world that provides the basis for forming expectations and interpreting given texts. Semantically interconnected concepts in a text seem to invoke in the reader's mind conceptual 'frames' or 'schemas' (Van Dijk, 1977a; Kintsch, 1972; Fillmore & Kay, 1980), (5) on the basis of which he forms a hypotheses about the text, to be confirmed or repudiated by subsequent reading. For example, the first sentence in our cloze passage reads as follows:

7. A child born into society must be fed and looked after.

The words 'child', 'society', 'looked after' can be interconnected at least in Western culture within the conceptual schemas of child rearing and family structure. Thus the reader can already on reading the first sentence form hypotheses about the relevant context of situation for the text and

its possible major topics. Individual differences in level of education will determine the specificity of these hypotheses. For the educated adult reader the 'family' schema in the context of sociology will also contain concepts such as 'family members', 'siblings', 'socialization' and 'extended family' and he will not be surprised to find these in the text. When presented as a cloze test, the completion of some of the items can rely entirely on familiarity with the relevant frames:

8. As a child grows up, surrounded by brothers and sisters, his parents and sometimes a member of the _____ family, he gradually learns things about the society in which he lives.

The collocation 'extended family' should be almost automatically provided by readers familiar with sociology. It could be claimed perhaps that since placing a text conceptually in its relevant context is part of the reading process, restoring some of the markers of such a placement can be considered as proof of reading comprehension.

But in many cases, the cloze items whose completion requires extra-textual knowledge is accompanied by exophoric reference, i.e., presupposes that the reader is familiar with the concept (or person) referred to. The use of 'the' before 'extended family' in 8. exemplifies this tendency. Replacement of such items on a regular cloze only differentiates students familiar with a given subject from those who are not. An exploratory error analysis of a cloze text dealing with the British Mandate in Palestine (Nir & Blum-Kulka, 1980) revealed many examples of this phenomenon:

9. In 1922 the British Government published its first 'White Paper'. According to this document the _____ Declaration did not cover

cover the eastern part of the Jordan.

The Balfour Declaration referred to here in the full text is not mentioned again anywhere else in the text; completion of such items is therefore entirely dependent on extratextual knowledge.

It is also worth noting that the lexical density of a text (measured simply as the number of content words divided by the total number of word-tokens and expressed as a percentage) varies according to the text genre (Ure, 1969) and consequently the percentage of items requiring lexical completion -- and hence often pragmatic competence -- will also vary from genre to genre.

2.3. The textual component

A third component of reading, not exemplified so far, is, we assume, the ability to follow the cohesive ties in a text in order to understand the interrelationship between the sentences (Halliday & Hason, 1976). This ability differs from linguistic and pragmatic knowledge in that it is specific to text-processing as distinct from sentence-processing. In a regular cloze test, this ability will be tested by the deletion of items that can only be restored if the relationship between propositions (i.e., at the macro level) is understood:

10. In other words, the child will _____ the culture of his society through his contact with, at first, the members of family.

The restoration of 'learn' (rather than 'understand' or 'doubt', etc.) comes most easily to the reader who sees that the function of this sentence is succinctly to restate ('in other words') the point made in previous sentences, and that the same lexical verb used there must now be repeated.

Since the deletion in regular cloze testing is by definition random, the number of items of this nature, that test the textual component of reading, will vary from text to text. It seems likely, however, that they will always be in the minority. What we suggest, therefore, is a discourse completion exercise in which all the items deleted will test this textual component. It is the features and implication of such a test that we must now examine in detail.

3. Discourse Cloze: what it contains

In such a test, which we shall call a 'Discourse Cloze', the principle governing deletions differs from that in regular cloze, where they usually occur at mathematically identical intervals throughout the text. However, to subjects completing a discourse cloze, the task appears to be the same as on a regular cloze test; they are asked to supply the items that have been deleted from a passage of continuous written discourse. The difference between the two tasks lies in the nature of the items chosen for deletion. In regular cloze, any item may be deleted, as determined by arithmetical, non-linguistic criteria. In discourse cloze, only those items are deleted which mark, in one way or another, relationships between propositions. Whether the respondent explicitly recognizes the principle (or lack of principle) on which such deletions have been made may or may not affect his success in restoring the missing items: this remains to be investigated.

The study of explicit interrelationships within text has been carried out most systematically in Halliday and Hasan, Cohesion in English (1976). The range of items that may be deleted in a discourse cloze can best be demonstrated by a survey of the categories of cohesive relationships

which Halliday and Hasan have set up. This time, however, we shall not be able to give examples from one particular passage. Our first aim is to show the total range of items eligible for deletion, rather than those that would be deleted from any specific text. Hence the miscellaneous nature of sentences 11 to 23, some borrowed, but most invented for the occasion.

1. Anaphoric reference

11. Alice opened the door and found that it led into a small passage, not much longer than a rat-hole; _____ knelt down and looked along the passage.

Only 'she' and not 'he/they/it' shows a grasp of the sequence of events described in the narrative.

12. The Queen said 'Curtsey while you're thinking what to say. It saves time'. Alice wondered a little at _____, but she was too much in awe of the Queen to disbelieve it.

Only 'this' shows an understanding of the way an immediately preceding utterance is referred to in narrative prose.

11. Substitution

13. 'Is it raining?' 'I hope _____ -- then I won't have to water the garden'.
14. 'Is it raining? I hope _____ -- I haven't yet tarred the roof.'

Note that in order to make the correct choice between 'so' and 'not', it is not enough to know the grammatical patterns of clause substitution.

You also need to draw the appropriate inferences about the relation between rain, watering gardens and tarring roofs.

iii. Ellipsis

15. 'Are you coming to the party tomorrow?' 'Yes, I _____'.

Only 'am' -- and not 'have/do/can' -- show a grasp of the question/answer relationship between the two sentences.

iv. Conjunction

16. German industry was left in ruins by the Second World War. _____, by 1955 she was economically the strongest nation in Europe.
17. When Schacht took over, the German mark was almost worthless. His first task, _____, was to restore confidence in the currency.

Note that as with examples 13 and 14, each pair of sentences must be fully understood and the appropriate inference drawn about the relationship between them before a suitable sentence adverb -- 'however' and 'therefore' respectively -- can be inserted.

v. Lexical devices

18. (Repetition) He will believe anything she tells him. He will even _____ that two and two are five if she says it's so.
19. (Hyponymy) Germany was left in ruins by the Second World War. Yet within a decade she was the strongest _____ in Europe.
20. (Antonymy) Why do little boys wriggle all the time? _____ don't wriggle.
21. (Synonymy) Only if you draw an appropriate inference about the relationship between the sentences will you be able to insert a _____ sentence adverb in the text.

22. (Collocation) For a while they rode in shadow. Then suddenly there were no more trees, and she felt the _____ on the back of her neck.

Obviously, this is not a complete list of all possible markers of cohesion. It does, however, include representative examples of each of the general categories. Before we go on to consider the psycholinguistic implications of this form of testing, it might be wise to remove certain misunderstandings that could arise from the nature of the examples chosen:

1. Cohesive relationships exist within sentences as well as between sentences. This is well illustrated by example 11, where the relations between 'appropriate inferences' and 'suitable sentence adverbs' is actually between the protasis and the apodosis of a conditional sentence. Although for ease of exposition we have occasionally referred to relationships between sentences, strictly speaking cohesive markers are used to indicate the relationship between propositions.

11. In order to provide a clear and convincing illustration of each category, we have sometimes chosen a short dialogue rather than a passage of expository prose, e.g., examples 13, 14, and 15. One feature of such examples is that the distance between a cohesive marker and its antecedent will be relatively short; in sentences 13 and 14 only the two words 'I hope' intervene between 'raining' and 'so/not'. This somewhat falsifies the nature of cohesive markers in continuous prose, where the distance may be much greater. Example 11, with a distance of 18 words between 'she' and 'Alice', may be more representative in this respect. In fact, cohesion is not restricted to adjacent sentences. It can span any number of sentences with a consequent increase in distance between an anaphoric referent and its antecedent, or

between two occurrences of the same lexical item. As Halliday and Hasan point out, "the cohesive force that is exerted between any pair of lexical items in a passage of discourse is a function of their relative proximity..." The difficulty in restoring deleted cohesive markers may similarly be related to the distance between the items.

4. Discourse Cloze: how it works

It could be claimed that in discourse cloze testing, where deletions are non-random and consist solely of cohesion-markers, no account is taken of the student's ability to interpret relationships at the micro-level. It should, however, be remembered that the ultimate aim of any reading of a non-literary text is to derive macro-propositions (see Van Dijk, 1977a). To achieve this aim the reader, as he reads, reconstructs the macro-structure of the text. There is plenty of evidence to suggest that such a reconstruction is possible without a complete interpretation of the entire micro-structure (Kintsch, 1972; Vipond, 1980). The 'good reader' succeeds in distinguishing what is of major from what is of minor significance. In the process of reading he manages to sort out those micro-propositions which are relevant to the reconstruction of the macro-propositions (Van Dijk's 2nd rule in his 'macro-rules' -- *ibid.*). In a regular cloze, where deletions are random, it is obviously impossible to distinguish between deletions whose restoration indicates a grasp of the macro-structure and deletions whose contribution to the deriving of the macro-propositions is not crucial. In evaluating a regular cloze test, equal weight is given to each correct replacement, whether it shows an understanding of the micro-structure or

whether it is a cohesion-marker, i.e., indicates an ability to reconstruct the macro-structure. A student may well succeed, for instance in restoring most of the deletions which relate to the micro-structure, yet at the same time have difficulty with those deletions which require an understanding of the macro-structure. Discourse-cloze attempts to test reading comprehension at the 'higher' level, i.e., at the macro-level. It is true that confining the deletions to cohesion-markers alone amounts to foregoing in part any examination of a subject's grasp of micro-relationships ('in part' because macro-level markers do sometimes test understanding at the micro-level as well -- see in particular examples 13 and 14 above). It should, however, be remembered that "understanding" a text necessarily entails, as stated, a correct interpretation of macro-relationships.

From various experiments with cloze tests conducted in Israel in recent years, it has become clear that subjects classified from the start as weak tend to fill the blanks in a cloze test according to the micro-context, even when such a completion does not match the broader context (Nir, Ben-Amitay & Sharir, 1981). This syndrome recurs again and again, even though the instructions given to subjects stress the need to read the entire cloze text before beginning the task. This finding is in line with the conclusion of Vipond (1980), that variables connected with the text's macro-structure are better predictors of reading comprehension with 'good readers' than micro-variables (ibid., p.293). It seems that a good reader manages to 'move' between micro- and macro-level, using appropriate strategies in processing relevant information in units at the micro-level so as to refashion the macro-structure. Such a reader does not reach a final interpretation of each new item of information, but ascribes a relative

weight to each item in the light of previous and subsequent propositions. In other words, such a reader probably processes the text in the form of a branching programme as distinct from a linear progression.

Our hypothesis is that correct completion of macro-level items deleted from a text indicates a proper understanding of the discourse and its coherence, and 'the realization' of this coherence at the level of cohesion (as the terms are distinguished by Widdowson, 1978). The good reader utilizes a range of indicators in constructing the macro-structure of a full text. Such indicators are not restricted to individual words of the text. They also include headings and subheadings, an author's declaration of intent, word order in sentences (topicalization), the degree of specification given to certain topics and extra-linguistic features such as differences in type-face. All these indicators remain in the text after it has undergone the 'treatment' of discourse-cloze. It is assumed that the good reader brings together indicators at all levels in order to reconstruct the macro-structure, works out the pattern of coherence that unifies the discourse, and thus is able to restore the cohesion-markers omitted in the discourse-cloze.

The cohesion-markers that we suggest should be deleted belong to two major categories: markers of co-reference (examples 10-15 and 18-22) and connectives between propositions (examples 16-17). Completing the blank for the former obliges the student to discover the antecedent to which the marker of co-reference refers, or with which the marker of ellipsis is congruent; in other words, to identify the relationship between topics of the discourse. The semantic load carried by such an item is not independent

but depends on another element to which it refers (cf. Halliday & Hasan, 1976, pp.29-30). In discourse-cloze this second element is located in the text. That is to say, items deleted should include endophoric reference only, not exophoric. Thus correct completion of the items in a discourse-cloze tests understanding of the coherence of a text without the student requiring any extra-textual knowledge. Restricting the deletion of referential markers to cases of endophoric reference only is thus likely to 'neutralize' the pragmatic component of reading ability. This is important in view of the fact (see section 2.2. above) that texts may differ -- sometimes to a considerable extent -- in the amount of extra-textual knowledge required to understand the information they contain.

Endophoric reference can also be distinguished in terms of relationship to the antecedent. Halliday and Hasan distinguish between anaphoric reference ('backward' reference, where the antecedent occurs previously in the text) and cataphoric reference ('forward' reference, where the 'antecedent' is explicitly identified subsequently). There are also occasions where the reference is not to a definite item but to an event previously described. In such cases a subject who has to replace the deleted reference-marker has to perform a more complicated cognitive task, since there is no explicit antecedent, and its identification requires generalization and abstraction.

The second category of cohesion-markers includes inter-propositional connectives. These are among the group that Halliday and Hasan call conjunctions. Such markers indicate logical and rhetorical functions (Selinker, Todd-Trimble & L. Trimble, 1976): temporal sequence, cause,

contrast, addition, itemization, exemplification, and so on. In order correctly to restore deletions of this category, the respondent must determine the underlying coherence relationships and find the appropriate surface exponent (see examples 16 and 17 above). The discovery of interpropositional relationships is a basic condition for reconstruction of the macro-structure and derivation of the macro-propositions. In discovering such relationships the reader utilizes not only various indicators in the context but also his knowledge of the genre and (its appropriate cognitive schemas (Adams and Collins, 1978). In the case of narration, for instance, the reader expects to find a sequence of events occurring in temporal succession, and shall thus be able to supply the correct temporal connective linking propositions that describe two such events. Knowledge of schemas also helps in restoring various cohesion markers, e.g., 'John and Alice decided to go to the cinema. _____ they purchased their tickets, they entered the auditorium'. Supplying the word 'after' relies both on the principle of chronological sequence and on knowledge of the schema of cinema attendance, according to which purchase of the ticket precedes entry into the auditorium. Reliance on schemas is not so much a dependence on specific extra-textual items of information, but rather the ability to assimilate the content of a passage in terms of known pattern of behavior and the social ethos which serve as the circumstantial link between events.

Completing the items therefore in a discourse-cloze involves the operation of various strategies in order to decipher the macro-structures, including processes of generalization, assimilation and integration. The student must operate such strategies, at the same time foregoing the use

of lexical and grammatical cohesion-markers (which have been deleted from the text).

It seems, therefore, as if the student is faced not merely with an unnatural situation but with impossible conditions: he must prove his grasp of the coherence of a text without making use of the cohesive devices that mark the relationships between propositions. Actually, however, as we have seen, there are other, non-lexical, indicators in the text by means of which its coherence might be reconstructed. In requiring the restoration of markers of cohesion, we rely on the assumption that linguistic redundancy is to be found at the macro-level as well as the micro-level. It is this redundancy which enables the student to derive the macro-structure even from a deficient text, and consequently to supply the appropriate cohesion-markers which have been deleted.

The question arises whether discourse-cloze is capable of distinguishing a range of abilities in a typical population of readers. In a pilot test with 400 sixth-grade children in Israel, we found indicators that this was indeed the case. We took a passage in Hebrew (the children's native language) and adopted it for use both as a regular cloze and as a discourse-cloze. In each treatment we deleted the same number of words: in the regular cloze, we regularly deleted every seventh word, whereas in the discourse-cloze we deleted only cohesive markers, with lesser regard to the size of the interval between successive deletions (though we avoided deleting adjacent words). The tests were given for completion to students learning in the same class (in each class half the students received the regular cloze and the other half received the discourse-cloze). From analysis of

the results it is clear that the average number of semantically acceptable completions in both tests is fairly close (with the average on the discourse-cloze slightly higher than on the regular cloze). The distribution and variance of answers was also similar on the two varieties of test. These results suggest that the discourse-cloze has the ability to distinguish between different levels of achievement in reading, at least as well as the regular cloze.

Hitherto we have assumed that discourse-cloze involves the deletion of single words. This is indeed the case as far as an analytic language is concerned, where most grammatical relationships are expressed by means of independent, free morphemes. In such languages, each reference and each inter-propositional connective is usually an orthographic word. But this fact, taken for granted for a text written in English, is not so clear for a text written in an inflectional language, where greater use is made of grammatically bound morphemes. In Hebrew, for instance, pronominal reference is frequently expressed by means of bound morphemes. Deleting such a pronoun means deleting a suffix or even a discontinuous morpheme. This applies also to some of the connectives. The pronouns are generally marked by means of suffixes and the connectives by prefixes. The construction of discourse-cloze in Hebrew, therefore, requires either the deletion of a cohesion marker together with a content-word, or the deletion of part of a word, or the whole word. Neither alternative is desirable. If we delete the content word as well as the cohesion marker, we turn the discourse-cloze into a regular cloze. And deletion of part of a word, especially a suffix, is problematic in Hebrew, since most of the vowels are not indicated in Hebrew orthography, and the deletion of consonants is liable to mislead

the student. The most viable solution in such a case, it seems to us, is the construction of a multiple choice, clozed discourse-cloze. If the language is inflected, we can offer the student among the distractors the same content-word with inappropriate suffixes; choosing the word with the suffix appropriate to the macro-context will testify to a correct understanding of the macro-structure. Such a test has additional advantages: it avoids confronting the tester with the difficulty of deciding whether to regard a particular answer as acceptable (experience has shown that in many cases there is a range of possible completions, and some of them are of 'doubtful acceptability').

Finally, some comments on the possibility of using discourse-cloze as a didactic tool for teaching reading comprehension. The unique property of the proposed test is its concentration on macro-deletions only. This enables any teacher interested in so doing to cultivate one specific aspect of reading comprehension: unravelling the macro-structures of a text. It is this aspect which is frequently neglected, especially when most attention is devoted to the understanding of sentences, i.e., to the micro-structures. The question what is the most appropriate completion from the point of view of inter-propositional relationships in the text is likely to raise interesting considerations, partly linguistic and partly logical. Finding the correct completion requires understanding words, syntactic structures, and logical and rhetorical relationships between various propositions. Exercises based on discourse-cloze would thus seem to be training students in language and thinking at the highest level of reading comprehension. Experience has shown that students enjoy such exercises and the class discussion involved with them. In putting forward arguments

for and against particular completions, the student becomes more aware of the ways texts are structured. It can be assumed that the student is likely to derive benefit not only by developing strategies for reading comprehension, but also at the level of writing ability. For didactic purposes, however, the open-ended discourse-cloze is preferable, since it provokes discussion in all directions, and is not restricted to a limited number of alternatives.

In Conclusion

In this paper we have attempted to argue, on theoretical grounds, the validity of a new technique for testing reading comprehension, the discourse-cloze. This technique, we believe, shows considerable promise for research into reading comprehension. We have suggested four reasons for this belief:

- i. the importance of a grasp of cohesion as a factor in reading comprehension of continuous discourse.
- ii. the usefulness of this technique in isolating the grasp of cohesion for separate testing.
- iii. the elimination of extra-textual knowledge as a factor affecting one's understanding of a text.
- iv. the feedback from such a technique on methods of teaching as well as testing reading comprehension.

In a later paper we hope to present empirical data from ongoing research based on the testing technique which it has been the purpose of this essay to explore.

NOTES

1. We wish to thank Larry Selinker for his very useful comments on an earlier version of the paper.
2. A recent approach to the study of the psychological processes involved in reading, currently being developed by Fillmore and Kay, uses personal interviews with students to investigate the process by which readers construct an understanding of a text as they read it (Fillmore & Kay, 1980; Fillmore, 1981).
3. Alderson's (1978) two major findings were: a) that deletion rate has no effect on the readability of a cloze gap, and b) different deletions frequencies produce different texts, which appear to measure different abilities unpredictably. He interprets these results as suggestions that "as a test the cloze is largely confined to the immediate environment of a blank" (1978:25), and hence is not capable of measuring the ability to handle text rather than sentences.
4. The experiment referred to has been conducted with 102 students studying Hebrew as a second language. Although the two texts used in the experiment were judged by teachers to be of similar difficulty, they yielded very different mean-scores: 31.5 (Text A) and 60.57 (Text B). We suggest that this difference is attributable to the high number of items (50%) requiring extratextual knowledge in text A. This suggestion is supported by another result: under the 'discourse' treatment (i.e. the same tests given as 'discourse-cloze'; see below) the difference in mean-scores dropped to 2%!

5. We use the term 'schema' in Fillmore and Kay's sense: "basic structural outlines which may be induced or evolved on the levels of genre and content. A genre schema represents the basic structure of a text of any given genre... Content schemata include knowledge of the world, including such things as social and cultural institutions" (1980:27-28). For an analysis of the difference between various terms used in this context (e.g., 'frames', 'scripts' and 'schema') see Tannen (1979).

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APPENDIX A

A child born into society must be fed and looked after. In many societies, the parents of the child are responsible for his welfare and therefore perform a function for society by looking after the next generation. As the child grows up, surrounded by brothers and sisters, his parents and sometimes by a member of the extended family, he gradually learns things about the society in which he lives. For example, he will learn its language, its ideas about right and wrong, its ideas about what is funny and what is serious and so on. In other words, the child will learn the culture of his society through his contact with, at first, the members of his family. The way in which an individual acquires the culture of his society is known as 'socialization'. Socialization is not confined to communication and the relationship between parents and their children, nor does it finish in childhood but it goes on throughout life. At the present time, research by social scientists indicates that the early years of childhood are important in the development of the individual and they have lasting effects on his ideas and attitudes.